

Name: \_\_\_\_\_

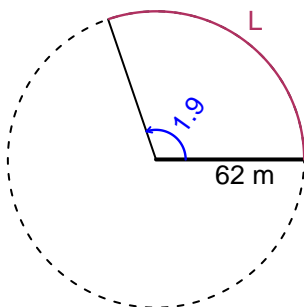
Date: \_\_\_\_\_

## Trig Final (TEST v640)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

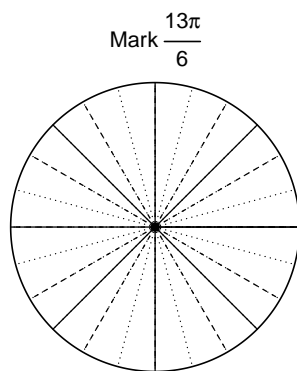
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The angle measure is 1.9 radians. The radius is 62 meters. How long is the arc in meters?

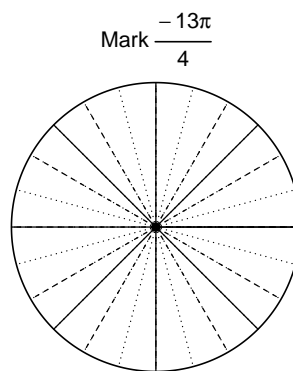


### Question 2

Consider angles  $\frac{13\pi}{6}$  and  $\frac{-13\pi}{4}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(\frac{13\pi}{6}\right)$  and  $\sin\left(\frac{-13\pi}{4}\right)$  by using a unit circle (provided separately).



Find  $\cos(13\pi/6)$



Find  $\sin(-13\pi/4)$

**Question 3**

If  $\tan(\theta) = \frac{72}{65}$ , and  $\theta$  is in quadrant III, determine an exact value for  $\sin(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 8.06 meters, a midline at  $y = -3.63$  meters, and a frequency of 5.56 Hz. At  $t = 0$ , the mass is at the maximum height. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).